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1878

THE RELATIONS
OF
SCHOLASTIC METHODS
TO THE
Health of Pupils in the Public Schools

A PRELIMINARY INQUIRY INTO THE SUBJECT.

BY THE SECRETARY OF THE STATE BOARD OF HEALTH.

MINNEAPOLIS:
JOHNSON, SMITH & HARRISON.
1878.

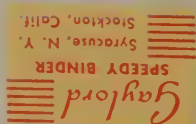
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ERRATA.

PAGE	3.	LINE	5, from the top, for "come" read "came."
"	5,	"	10, from the bottom, for "institution" read "institution."
"	7,	"	1, from the top, for "Are no" read "No."
"	14,	"	12, from the top, for "positlon" read "position."
"	18,	"	1, from the top, for "Fobwell" read "Folwell."
"	22,	"	8, from the bottom, for "Free" read "Few."
"	25,	"	12, from the top, for "where they enter" read "when they enter."
"	38,	"	6, from the top, for "Suellen's Type" read "Snellen's Type."
"	38,	"	5, from the bottom, for "exercises" read "examinations."





HEALTH OF PUPILS IN THE PUBLIC SCHOOLS.

Herewith are submitted the replies received to a series of questions addressed to some of the leading teachers of the State, and also to the President of the University of Wisconsin, by the Secretary of this Board.

As they come to hand it was thought advisable to secure the vital statistics of the schools concerned. By the kindness of the physicians, who collected them, they have been made as extensive and accurate as the limited time would permit. Both the replies and the statistics, indicate very clearly the necessity for the further careful collection of the facts, of the influence of our scholastic methods upon the health of scholars. They demonstrate that the teachers of our State are keenly alive to this necessity and anxious to assist in every way possible. It is gratifying also to note that the replies received show a disposition not to prejudge some of the matters under discussion, but to await a more careful and searching investigation than has hitherto been made.

Encouraged by this feeling, and the promise of hearty co-operation, from teachers and physicians this Board will, as soon as possible, prepare and distribute to such schools as will use them, suitable tests for hearing, sight, weight, height, chest capacity, etc. with directions for use, with them will also be sent a form of blanks for the record of these and other vital and health statistics of pupils.

The Board of Regents of the University, at the suggestion of the Secretary of this Board, have ordered the collection and record of such statistics for every student entering the University, and that such record be revised once a year during attendance there.

If this example is followed in the schools of higher grade throughout the State, there will be secured a collection of reliable data—trustworthy facts—such as can be obtained in no other way. The effort will be made in the common schools so far as the co-operation of county superintendents shall be given. It is proposed also to obtain information as to the construction and furnishing of

existing school-houses and rooms—their lighting, ventilation and warming; the form and location of school desks and seats, and their relation to light; the effect of text books in use, as respects size, type, print, and illustration, as also of the color, location, and use of blackboards and crayons, on sight.

Inquiry will be made as to the number of hours devoted to study, recitation, and recreation, during school time; the system of rating excellence in school; the use and influence of competition and rewards upon scholars; as also of methods of examinations, vacations, and the practicability of half time schools.

The subject of co-education of the sexes will be studied in the light of these statistics, the testimony of teachers, and the observations of medical men. The evidence of parents of pupils, and of graduates of either sex, of such schools will be asked for.

The vital statistics of schools for one sex alone, and the evidence of their teachers and medical attendants will be sought for, that the fullest scope may be given to the inquiry. In beginning this work this Board rely upon the hearty aid of teachers and the medical profession. To the latter they must look for the collection of vital and health statistics chiefly, their professional skill and observation are necessary to the accuracy and thoroughness of the work.

CONDENSED ABSTRACT OF REPLIES RECEIVED TO QUESTIONS PROPOSED TO TEACHERS.

No one whose reply is here given had sufficient time for careful elaboration of the answers to the questions proposed. The replies for that reason fairly exhibit current opinion upon the subjects to which they relate.

Taking the questions in their order, the answers received may be summed up as follows, reference always being had for details to the replies themselves, which are appended to this paper in the order of their quotation:

1st question:

Comparative health of girls and boys on entering school?

In the Universities—Wisconsin, "about the same." Minnesota, "boys supposed to be better." Carleton College, "not so good."

In the Normal Schools—Winona, "as a rule, girls in good health." Mankato, "No difference." St. Cloud, "Not so good."

In the City Schools—St. Paul "no difference." Minneapolis, "favorable." Red Wing, "Not so good and is less in the higher grades."

In the Common Schools—Superintendent of Public Instruction, reports "no great difference."

Institution for Deaf, Dumb and Blind—"No difference observed."

The uncertainty evident in the replies is due 1st, to the absence of any recognized standard of health either for boys or girls, or common to both sexes, and 2nd, to the absence of any record of vital or health statistics.

The rule of requiring a record of vital and health statistics upon entering school and a correction of that record for every subsequent year of school attendance, will alone give accurate answers to this question. It is hoped that this rule will be general hereafter in at least the higher schools. The advantage to pupil and teacher alike of such knowledge will amply repay the trouble of the record. It has happened to the writer to know that defects in sight and hearing have been greatly aggravated, after the entering school because of the ignorance of the teacher of these defects, on the part of the pupil, and of the pupil's effort to use them at a distance of which they were incapable. There is no doubt that serious disease has resulted in many cases from such ignorance. A slight but accurate test of the sight or hearing would have prevented it.

2nd question.

Average scholarship of girls and boys compared?

In the Universities—Wisconsin, "girls better." Minnesota, "girls probably higher." Prof. Peckham gives statistics of relative standing, claiming "girls to be, in every respect, the equal of boys in his department." Carleton College, statistics of five years carefully collected give the girls the highest standing in every class of the college.

In the Normal Schools—Winona, "girls 10 per cent. higher." Mankato, "no difference." St. Cloud, "girls as good, probably better than boys."

In the City Schools—St. Paul, "girls may average higher." High School, "girls better." Minneapolis, "on the whole girls better than boys." Red Wing, "uniformly better, statistics prove it."

In Common Schools—No difference under 12 years of age.

Institution for Deaf, Dumb and Blind—"Statistics give girls from one to two tenths better standing.

As the standard is a settled one, common to both sexes, and relative standing is a matter of record, there is less uncertainty in the answers to this question.

It is to be noticed that when ever the statistics are given the standing of girls is always equal to, and as a rule higher than that of boys. See the statistics given by President Strong, of Carleton College, Prof. Peckham of the University, and Prof. Whitman of the Red Wing schools.

In a recent paper presented to the New York Academy of Science. Prof. Peckham instances a young lady student of the University, as "the most accurate and skillful manipulator in analytic chemistry he ever had under his instruction."

3rd. question:

Do those girls who are best in scholarship fall below other girls in health?

In the Universities—Wisconsin, "No." Minnesota, "No." Carleton Collage, "Doubtful."

In the Normal Schools—Winona, "As a rule not the most robust." Mankato, "No." St. Cloud, "Not likely to."

In City Schools—St. Paul Supt. "No; think better." High School staff, "To some extent, yes; because of harder study and greater mental exertion." Minneapolis, "Probably, yes." Red Wing, "Emphatically, no."

In Common Schools—Supt. Pub. Instruction, "Good scholarship in both sexes, associated with nervous temperament, somewhat at expense of muscular development."

Institution for Deaf and Dumb and Blind—"Best scholars enjoy best health."

Here again the absence of a common standard of health and of a knowledge of that of individuals, except as may appear in the ordinary performance of duty, makes a definite answer difficult. All concede that a careful observation and record of all the available facts are necessary to the answer of this question. And it is all the more necessary because the conclusion reached, will have much to do with opinion as to the healthfulness of co-education.

4th question:

Are girls absent on account of sickness more than boys?

In the Universities—Wisconsin, "Much less."—See statistics in Pres. Bascom's report. Minnesota, "Think they are." Carleton College, "Yes."

In the Normal Schools—Winona, Mankato, St. Cloud, all reply "Yes."

In the City Schools—St. Paul, "No." High School, "No." Minneapolis, "Think not." Red Wing, "Yes."

In Common Schools—State Supt. Pub. Instruction, "Not before puberty."

Institution for Deaf, Dumb, and Blind, No. Daily and weekly reports prove it,"

The statistics of the University of Wisconsin give a very decided negative to this question, and shows further that more boys than girls there, are compelled to leave college on account of ill health.

Are no detailed statistics available at this time in Minnesota.

The balance of opinion in the State as represented in the replies. is that girls while attending school are oftener disabled by sickness than boys. See the replies themselves for details.

As bearing upon the question of co-education, see the extracts from the Wisconsin reports.

Special attention will be paid to this subject, in the inquiries of the coming year.

5th. question.

Does the general health of girls decline as they continue in school :

In the Universities—Wisconsin, "no. Statistics to prove it." Minnesota, "Do not think it does : "Carleton College, "no more than at home."

In the Normal Schools—Winona, "It improves," Mankato, "No" St. Cloud, "Not necessarily."

In the City Schools—St. Paul Supt. "No," High School (staff) "yes as regards those highest in scholarship." Minneapolis, "I am confident that a decline in health is quite marked." Red Wing, "Not as a rule ; teachers agree in this."

Common Schools—Superintendent Public Instruction, "not sooner than boys under puberty.

Institution for Deaf, Dumb, and Blind—"No." Improves as they advance in the school.

The statistics in the University of Wisconsin indicate a decided improvement as they continue in college.

The opinion of the Principals of the Normal Schools is that health does not decline, and at Winona it improves.

In the City Schools—Opinions differ and are about evenly divided.

It is evident that statistics are to necessary the decision of this question also. Medical men can give great assistance here and they will be called on for help.

6th question.

Do girls get as much physical exercise, of the proper kind, as they need while attending school?

In the Universities of Wisconsin and Minnesota. "No." Carleton college. "No."

In the Normal School—Winona and St. Cloud, "No." Mankato. "Yes."

In the City Schools—St. Paul. "Doubtful." Minneapolis. "No." Red Wing. "Lower grades, Yes. In the higher grades No."

In the Common Schools—Superintendent Public Instruction. "In county Yes. In city No."

Institution for the Deaf, Dumb and Blind—"No."

Here is mainly unanimity of opinion and it agrees with the reported experience elsewhere. Girls do not get as much exercise of the proper kind while attending school as they ought to have. Why not, and how to remedy the evils is subject for future inquiry.

7th question.

The effect on the health of girls of study out of school or taking music, or other lessons out of school hours?

In the University—Wisconsin. "No effect." Minnesota. "Is rather on scholarship than health." Carleton College. "Undoubtedly bad."

In the Normal Schools—Winona, Mankato and St. Cloud all report "unfavorable."

In the City Schools—St. Paul, "unfavorable." High School, (see Dr. Boardman's report). Minneapolis, "decidedly yes." Red Wing, "Yes."

In Common Schools—"Yes, attempting double work."

Institution for Deaf, Dumb and Blind—"Unfavorable."

A reference to the detailed answers in the replies will show a belief so general as to be practically unanimous that scholastic work out of school hours, is not advisable on the score either of scholarship or health. See especially Dr. Boardman's report on study out of school in St Paul High School, as also Prof. Peckham's remarks on this subject.

8th. question.

Would the separate education of girls affect the rapidity of their progress?

In the Universities—Wisconsin, "No." Minnesota, "not materially." Carleton College, "yes, unfavorably."

In the Normal Schools—Winona, "No." Mankato and St. Cloud, "Yes, unfavorably."

In the City Schools—St. Paul, "Yes, unfavorably." Minneapolis, "no advantage." Red Wing, "Yes, unfavorably."

In Common Schools—Superintendent Public Instruction, "the fault of teachers if the sexes do not as well together, as apart."

Institution for Deaf Dumb and Blind—"Yes, unfavorably."

Co-education is a fact in Minnesota in all departments of the public school system, and in Carleton College. Separate education is afforded only in schools under religious bodies. The statistics of these schools have not yet been obtained, but an effort will be made to secure them, as also the experience of the teachers conducting them. See the replies for a variety of views on this subject.

9th. question.

In what way, in your experience are *manners* and *morals* affected by co-education.

In the Universities—Wisconsin, "No manifest effect," Minnesota "Favorably," Carleton College, "Both improved."

In the Normal Schools—Winona, "Decidedly improved" Mankato "Just as in the family" St. Cloud, "Both improved."

In the City Schools—St. Paul, and Red Wing, "with judicious teachers co-education best."

St. Paul High School—"On the whole favorable." Minneapolis, up to 15 years of age both promoted by it. In advanced education, in the interest of morals, opposed to co-education: vide Prof. Tousey's letter.

In the Common Schools—Superintendent Public Instruction, "Favorable to both, with good teachers."

Institution for Deaf, Dumb, and Blind—"Favorable to both under good teachers."

This question is ably discussed in the replies to which the reader is referred, as also to the Wisconsin reports.

As far as Minnesota is concerned co-education is favored by most of the teachers, with the proviso that teachers be capable in their vocation.

Vital and Health Statistics of Scholars—The table gives the averages of the different measurements, and of years in school, the other numbers are not averaged, as regards the spirometer measurements, see Professors Sperry, and Thomas' note. With the now evident inaccuracy of the instrument, the spirometer records are only of value in this table, for *comparative* chest capacity. Another and accurate instrument will be used hereafter.

The measurements with the tape are accurate, and were taken over the dress of the girls and under the coat of boys.

QUESTIONS.

I. How does the average health of girls compare with that of boys, on entering school?

II. How does their average scholarship compare with that of boys?

III. Do these girls who are best in scholarship, fall below other girls in health?

IV. Are girls absent on account of sickness more than boys?

V. Does the general health of girls decline as they continue in school.

VI. Do girls get as much physical exercise, of the proper kind, as they need, while attending school?

VII. Does the fact of the girls studying out of school, or taking music, or other lessons, out of school hours, affect their health?

VIII. Would the separate education of the sexes affect the rapidity of their progress?

IX. In what way, in your experience, are *manners and morals* affected by co-education?

Any other fact or opinion as to co-education, not called for by above questions, which you wish to give will be acceptable.

REPLIES TO THE QUESTIONS.

NOTE.—The replies are numbered to correspond with the questions.

University of Wisconsin—President Bascom.

- I. "About the same."
- II. "Girls better."
- III. "No."
- IV. "Much less."
- V. "No." (Vide statistics collected for report to regents.)
- VI. "No."
- VII. "No effect."
- VIII. "No."
- IX. "No manifest effect."

[NOTE BY THE SECRETARY.—The following extracts from the report of the Visiting Committee, Board of Regents, University of Wisconsin; the report of the President of the Board of Regents, and the report of President Bascom give three views of the question of co-education.

They are convincing evidence of the difference of opinion among educated men as respects this subject, in a single school.

The result in Wisconsin has been to open up the discussion of the subject again. It is to be hoped that the method will be by a diligent and scientific search for facts rather than opinions.

FROM REPORT OF BOARD OF VISITORS TO BOARD OF REGENTS UNIVERSITY
OF WISCONSIN, PPS. 45, 46 AND 47.

"It is now several years since the experiment of the co-education of the sexes was begun in the University. In respect to the proficiency shown by the young women in the several classes during the recent examinations, as compared with the young men, our impressions coincide with former boards of visitors. They sustained the test at least as creditably as the young men, and, if there was a difference, we are inclined to think it was in favor of the young women. In the main, they excelled in the precision and promptitude with which they responded to questions. We were, however, deeply impressed with the appearance of ill-health which most of them presented. It would not seem probable that, by mere coincidence, so many young women should be congregated together offering this peculiarity. There are a few notable exceptions, but, as a whole, this appearance is unmistakable, and has given rise to considerable comment among the members of the board. There can be nothing about the hygienic condition of the University, in any of its parts, which would give rise to ill-health. Every part examined presented an appearance of cleanliness; the food in the Ladies Hall was wholesome and well prepared; the service rooms clean; the dormitories well lighted and aired, and of sufficient capacity. We are, therefore, compelled to look elsewhere for the cause.

Every physiologist is well aware, that at stated times, nature makes a great demand upon the energies of early womanhood, and that at these times great caution must be exercised lest injury be done—an injury which, it is well known, may prove permanent. In order to keep place in the University classes, where the sexes are educated together, no account is taken of the fact that the woman labors under a double disadvantage, as compared with the man. 1st, in the circumstance that nature compels compliance with its well established laws, and, as above stated, makes demands upon her energies; and, 2d, that to keep her class standing, the girl must devote more energy, and, consequently, work harder, to accomplish her task, making drafts upon her system, which, by the very nature of the case, is already taxed to meet the physiological demands made upon it. It is also well known that overwork, in whatever way induced, at the times indicated, will produce deterioration of the system, which generally manifests itself by bloodlessness, followed by a train of evils which it is not necessary here to enumerate. It is this very condition of bloodlessness which is so noticeable in the women of the University at this time; the sallowness of features, the pearly whiteness of the eye, the lack of color, the want of physical development in the majority, and an absolute expression of anæmia in very many of the women students, all indicate that demands are made upon them which they cannot meet.

Education is greatly to be desired, but it is better that the future matrons of the state should be without a University training than that it should be procured at the fearful expense of ruined health; better that the future mothers of the state should be robust, hearty,

healthy women, than that, by over study, they entail upon their descendants the germs of disease. And there is no more certain law than that of heredity. The over-wrought nervous system undermines the general health stealthily, but certainly, and its evil consequences are prolonged in many cases through life.

We are aware that the law organizing the University provides that it shall be open for the education of men and women. It is not therefore necessary that both classes of students be subjected to the same systematic course of training, mental drill being attained in a variety of ways, each leading to adequate results; and the thought impressed itself upon some of the members of the Board that the curriculum could be so ordered that both sexes might obtain University drill—adjusted in such a manner that each sex should be enabled to secure that form of education best fitted for his or her respective sphere—and that the system of compelling men and women to fare alike might be so modified as to preclude the possibility of causing disease. We are forced to the conviction that there is at present, a marked disparity between the health of the men and women of the University, and that, as a class, the women present undoubted evidences of physical deterioration. If the Board of Regents, however, consider it expedient to alter the curriculum in any way, we would earnestly recommend that particular attention be paid to the physical well being of the female students."

FROM REPORT OF PRESIDENT OF THE BOARD OF REGENTS, PAGE 12
AND 13.

The question of perpetuating the present system of co-education in the University has been revived by the report of the board of visitors, present at the last annual examination. This report, together with the comments of the President of the University upon the same subject, in his annual report to the Board of Regents, is herewith submitted :

The argument of the board of visitors relates more directly to the degree of education which female students are physically enabled to acquire within a given time, than to the expediency of co-education in the abstract. We are furthermore assured, in a semi-official way, that the board of visitors do not wish to be understood as recommending a denial of any of the existing privileges of the University to any class of students, but as suggesting, simply, such modification in the courses of instruction as will render them available to female students who may prefer less exacting mental labor, and a minor degree of culture.

It is not claimed that the problem of co-education has been finally determined, in its relation to capacity for mental culture, and still less in its relation to the personal association of the sexes in our universities. Nor is this problem in either respect one which can or ought to be determined upon special data, or upon limited observation and experience, here or elsewhere. The whole civilized world is concerned in the experiment, and by the final judg-

ment of all the parties to the controversy we shall be forced to abide.

However that may be, no doubt ought to obtain as to the duty of the University to maintain that higher standard of instruction by which alone it can claim an honest title to its proper rank and name. And if, unfortunately, there are students, or classes of students, unfitted by nature or preparatory training for that extent of progress and intellectual development necessary to entitle them to the honors and rewards of university education, obviously their place is elsewhere.

This view is further enforced by the fact that, by the law and theory of its organization, the University occupies a specific position in the general plan of public education, with duties limited to a special plane of educational service. Between its work and that of the common school, the high school, the private school, the academy or the boarding school, there is justly no conflict or confusion of energy, and can be none while neither seeks to usurp the proper function of the other.

So far as co-education refers specifically to the personal and social relations of the sexes, however, ordinary prudence suggests a considerable degree of conservatism. While we cannot consistently lower the standard of university education, there certainly exists no obstruction to the enforcement of such rules of discipline in respect to students in attendance upon the University, as best conform to the average views of parents and guardians, and a wholesome public opinion.

FROM PRESIDENT BASCOM'S REPORT.

"One thing we profoundly regretted in the report of the Board of Visitors, and that was the opinion expressed by them as to the health of the young women. There were some passing appearances, arising from excessive studiousness of a few not naturally strong, that gave the criticism a color of truth, and were, doubtless, the grounds of conviction in the minds of the committee. These reasons, however, were very partial and by no means sufficient for the broad conclusions drawn from them; conclusions arising from exceedingly limited observation, and which did not command the assent of all the committee- We regret these opinions because they tend to open a controversy just closed, and to compel us to travel a second time over grounds already painfully trodden, and this with the prospect of no other or better issue than that already reached. To be pushed back into the water, when we have just reached shore, is trying.

The Faculty, most of whom were in the outset opposed to co-education, and who have had years of observation both as to its relation to education and to the health of young women, pronounce earnestly and unanimously in favor the maintenance of the present method.

Contrary to the opinion of the visitors, the young women do their work with less rather than with greater labor than the young men, and certainly do not fall below them in any respect as scholars. We also believe this labor to be done by them with perfect safety

to health, nay, with advantage to health if ordinary prudence is exercised. The young women, whose health was primarily the ground of criticism, have improved in strength, rather than deteriorated, since they have been with us, though they may have burdened themselves with extra work which we do not counsel.

We confess to some surprise that so many of the medical profession bring forward for the first time in connection with co-education, a function familiar from the dawn of human life, as if it had the force of a fresh discovery in putting down this form of progress, when, in fact, it has no more to do with co-education than with separate education, can as well be provided for in the one form of instruction as in the other, and bears with ten-fold force against the labor of women as operatives, clerks, teachers, housekeepers, in which callings continuous hard work has been allowed to pass utterly unchallenged.

Though my conviction has been, previous to this report, that the health of the young women as a whole was better than that of the young men, and that there were striking instances of graduation among the young women with robust strength, I am striving to test this opinion by facts, so far with the following results. All excuses for ill health are given by me. The exact number of students in our collegiate and dependent courses is 357. Of this number 93 are young women, a trifle more than one quarter. During the past eight weeks, the most trying weeks in the year for students, there have been 155 days of absence from ill health on the part of young men, and 18 on the part of young women. The young women should have lost according to their numbers, 54 days, or three times as much as they have actually lost. The students were not aware that any such registration was being made. It may be felt that the young men are less conscientious in pleading ill health than the young women, and this is doubtless true; but I sharply question a young man, and rarely ask any questions of a young woman. I explain the facts in this way. The young men are not accustomed to confinement, and though sun-browned and apparently robust, they do not endure the violent transition as well as women. Study is more congenial to the habits of young women, and the Visiting Committee are certainly mistaken in supposing that they have to work harder in accomplishing their tasks. The reverse is true. In addition to the above bill of ill health against the young men, a corresponding large number of them has been compelled, from the same cause, to leave the University altogether.

A second showing of the registration, which I had not contemplated, but one very interesting, is this: the absences of the young women are almost exclusively in the lower classes. Of the eighteen, two are in the sub-freshmen, fourteen in the freshmen, one in the sophomore, one in the junior and none in the senior. The absences of the young men are evenly distributed, on the other hand through the entire course. The young women do not seem to deteriorate with us in health, but quite the opposite. I do not belong to the number of those who set lightly by health.—I would not sacrifice any measure of it for scholarship; but it has long seemed to me plain, that a young woman who withdraws herself from society and

gives herself judiciously to a college course, is far better circumstanced in reference to health than the great majority of her sex.

I repeat my thanks to the Visiting Committee for their labors, and have no doubt that even the mistakes which such boards may inadvertently make, will ultimately be productive of more knowledge and more safety.

JOHN BASCOM.

President University of Wisconsin."

FROM PRESIDENT WILLIAM W. FOLWELL, UNIVERSITY OF MINNESOTA.

MINNEAPOLIS, Nov. 15, 1877.

Dr. Chas. N. Hewitt, Secretary of the State Board of Health:

DEAR SIR:—The general health of the students of this institution has been so good that there has never appeared any occasion to make and record careful observations. The replies below are founded merely upon the impressions which eight years' experience in this place have left upon the writer, and they are offered subject to such corrections as scientific observation may at any time demand. I have little faith in any testimony upon this subject, except that which a large and careful series of observations shall furnish.

Questions not repeated, but answers numbered accordingly:

1. The health of the girls is that of young women in general, that of the boys, also of the health of the young men in general. I suppose the average health of boys of 12 and upwards to be above that of girls of same age.

2. The average scholarship of girls is probably higher than that of boys, but only a small proportion of girls advance into the upper classes. I find young women excelling in history and political economy. For instance, the last senior class graduated 13 men, 3 women. Of the six who ranked highest in political economy three were women.

3. No, the best scholars among the women are those in best health.

4. I think they are. We now keep our record so as to show the facts.

5. I do not think it does. More young women drop out of our classes in order to marry or to go into society than on account of failing health.

6. No. We have no gymnasium in which to give the proper physical culture and exercise.

7. Such extra work more frequently effects scholarship than health. Except in rare instances music and scholarship do not go well together.

8. Not materially I think. Girls have no trouble in keeping up with the average rate of progress, and few boys can advance more rapidly than that average.

9. In our experience without dormitories the students living mostly in families—the effects on manners and morals is favorable. I believe the co-education as now carried on is beneficial to both

the sexes. I believe we have better order than separate schools can have, and that without any trouble worth mentioning.

Remark.—Co-education was not undertaken in this institution on account of any theory; it simply came about. When the institution was opened as a preparatory school in 1867, young women came in and nobody thought to send them away. They have kept coming, and for one I am ready to continue the experiment indefinitely. As a teacher I should much regret to lose from my classes the clear-headed and earnest young women who attend them.

WM. W. FOLWELL.

FROM PROFESSOR S. F. PECKHAM, UNIVERSITY OF MINNESOTA,

MINNEAPOLIS, NOV. 13TH. 1877.

DEAR SIR,—I answer your questions as follows :

1. *Ans.* I have no means of knowing. As a general thing they *both* come from schools of lower grade than the University—High schools and academies. I have never heard that any differences had been observed in the health of pupils at such schools that could be attributed to sex.

2. *Ans.* The students with whom I am brought in contact are for the most part young men and women. The average young women are the most conscientious, orderly, and faithful students. These are essential to scholarship. In every class that I teach there are young women who are in every respect of scholarship the equals of the best young men. Here are some statistics. In three classes in general chemistry.

I.		II.		III.	
5 girls averaged.....	69.	7 girls averaged.....	78.	11 girls averaged.....	76.
21 boys ".....	71.	24 boys ".....	77.	21 boys ".....	73.

Three classes in chemistry applied to the arts.

I.		II.		III.	
2 girls averaged.....	78.	5 girls averaged.....	80.	5 girls averaged.....	72.
6 boys ".....	82.	12 boys ".....	79.	16 boys ".....	73.

Analytical Chemistry	
5 girls average.....	92
8 boys ".....	86

This class in general and applied chemistry was led by two girls. considerably in advance of all the rest of the class. In molecular Physics 7 girls average 78, and 30 boys average 78. These classes are freshmen and sophomore.

In classes two years below in Physical Geography, 17 girls averaged 71; 41 boys averaged 75. In Elementary National Philosophy, 9 girls averaged 72, and 37 boys averaged 68. In Elementary Physiology, 7 girls averaged 89, and 22 boys averaged 78.

The scholarship depends on *brains* and the use that is made of them, and not on sex.

3. *Ans.* I have no reason to think they do. I think some of our best scholars are among our best specimens of apparently healthy women.

4. *Ans.* President Fobwell is collecting statistics to answer these questions officially.

5. *Ans.* I answer that it has appeared to me that the young women of the University, may be divided into three classes, viz.:

First, those who come here provided with sufficient means to live comfortably and who come to study. They devote their energies to their work of securing an education, paying but little attention to society. They do not appear to be injured at all, but on the contrary they often appear to improve in color and other general indications of health and vigor.

Second, those who try to do two things at once—to secure an education, and at the same time to in no way or to no extent curtail the claims of society upon them, to more or less habitually spend the evening from 7 to 11 in company, and the night from 11 to 2 in study, or an attempt at study. Such ones break down in health or scholarship, sometimes in both almost inevitably. It would not be reasonable to expect other results from human beings, either men or women. The successful young men in our colleges as a general thing, cannot stand such a regimen, and do not attempt it; and if young women under such circumstances injure their health it is not, in my opinion, because they are women, but because they wickedly misuse the gift of life and the means to health.

Third, those who are forced by necessity to divide their energies between subsistence and education; who cannot starve while they study, but must work while they study. Among them are often found those who in a fair contest would stand in the front rank the equals of any young men in general scholarship; some of them stand there in spite of circumstances, declaring it is in them to do it if they die. It is idle to ask if they suffer in health; of course they do. They wear poor clothes, subsist on poor and insufficient food, in poorly warmed and ventilated apartments. Young men do the same thing, and I see no way to help it or prevent it in either case. They are too proud to accept assistance, and they do not ask for it. The young men and women are however in one respect not equally matched. The opportunities for earning money or the means of subsistence, are much fewer for young women than young men, both in number and kind. I have been asked if I knew of *anything* that a woman could do that was not sedentary. "Young men can build houses or gather the harvest, but I have not the physical strength," they say. I cannot answer such a question, perhaps you can."

My opinion is that when large numbers of young women like young men are willing to devote several years of their lives with all of their energies to securing an education, making it the business of their lives during these years, giving up society as young men do and studying evenings instead of nights, without robbing themselves of sleep, which you very well know is fatal to young persons; when this is done I believe that it will be found that boys and girls of one mother can study together.

6. *Ans.* I do not think any general answer can be given to this question. Some do and some do not. The same may be said of boys.

7. *Ans.* I don't believe it does, any more than it affects boys. Boys or girls who try to do two things at once must suffer in health or scholarship, sometimes in both. More girls take music lessons, in my opinion, than boys. The effects of overwork do not depend on sex so far as I have observed.

8. *Ans.* If I understand the question, I do not think it necessarily would.

9. *Ans.* I have been connected with two institutions in which there were both young men and women. One had dormitories, the other has not. I am entirely opposed to the dormitory system, under any and all circumstances for colleges. It may answer for boys and girls at boarding schools. I am especially opposed to the dormitory system for collegiate institutions admitting both sexes. In the University of Minnesota I have seen nothing to change the impression that I formed when I first came here; that the intercourse of young men and women here, unrestrained as it is by any artificial and unnatural attempts at regulation prompts a great deal of dignified courtesy on the part of the older and more thoughtful students of both sexes. The character and conduct of pure and earnest young women is not easily influenced by the thoughtless folly of those of either sex whom they do not fully respect, while the elevating influence of such persons over all with whom they come in contact in the natural intercourse of everyday life has never been questioned. A very large proportion of our young women are of that character. A standard of scholarship that well employs a person of average capacity is a very potent preventive of many difficulties, for on the one hand it keeps good students well employed, and on the other renders a prolonged stay in the University unpleasant or impossible to the idle and frivolous of either sex.

I made the acquaintance of co-education with strong prejudices against it, chiefly with reference to these considerations. They are rapidly disappearing. While I believe many of the barbarisms that degrade and disgrace our older colleges will lead a short and sickly life in an institution open to both sexes, I believe also that the character of students as determined by the scholarship maintained by the faculty, will largely determine the moral and social status of co-education. Here as elsewhere "eternal vigilance is the price of liberty."

Very truly yours,
S. F. PECKHAM.

FROM PRESIDENT JAMES W. STRONG, CARLETON COLLEGE, NORTHFIELD.

C. N. Hewitt, M. D., Secretary State Board of Health:

DEAR SIR:—The questions relating to the co-education of the sexes, submitted by you in behalf of the State Board of Health, have been considered. Premising, what you admit, that they do not cover the whole subject, but that some points of primary importance are not here discussed, we respectfully return our replies.

1. "How does the average health of girls compare with that of boys, on entering school?"

Unfavorably. We have no statistics to prove this precise point, but as indicating, in general, the relative physical condition of the two sexes, we give you some facts gathered during the last spring term by Dr. L. B. Sperry, our Professor of Physical Science. One hundred and fifty students, of whom about one-third were ladies, were examined. A few had been in attendance for years, and some were comparative strangers. The gentlemen averaged 19.84 years of age, 5.6 feet in height, and 148 pounds in weight. The ladies averaged 18.13 years of age, 5.26 feet in height, and 133 pounds in weight. The chest capacity, as determined by Barnes, Dry Spirometer" ranged from 145 to 455 cubic inches, and averaged 285 cubic inches. Only one young lady had a chest capacity exceeding 260 cubic inches, and only one young gentleman had a capacity less than 245 inches. The average capacity of the gentlemen was 330 inches, and that of the ladies 183 inches. It is seen that in age, height or weight, the gentlemen exceed the ladies only about ten per cent., while in chest capacity they exceed them about eighty per cent. Physiologists affirm that the female pulse, (and hence her respiration) is about one seventh more rapid than the pulse of males. Adding then one seventh to the average chest capacity of the females, and we have 209 cubic inches, which still leaves the ladies about 57 per cent. behind the gentlemen, in lung power. And yet, we believe that the lady students of Carleton College, upon whom these observations were made, are not below the average young woman, in health and physical development. These statistics do not answer the whole question as to relative health, but they are certainly significant.

2. "How does their average scholarship compare with that of boys?"

That our reply may have a substantial basis in fact, and not be a mere opinion, we have examined our records for the last five years, and carefully computed the average standing in scholarship, of the different classes, in our various courses of study.

The results obtained are as follows:

In our *English Course*, which covers four years, and is not a college course at all, the gentlemen have averaged (on a standard of 100) 77 and the ladies 81.

In the *Preparatory Course*, which covers three years, the gentlemen have averaged 79, and the ladies 82. Combining these two sub-collegiate courses, the averages have been, gentlemen 78, ladies 81.

In the regular *collegiate course* of four years, the gentlemen have averaged 85, and the ladies 88.

While in the earlier departments the ladies have constituted about one third of the whole number, in this course, they have fallen to about one fifth.

Combining all the courses, the general average for the five years has been, gentlemen, 80.7, ladies 83.8. Thus it appears that in each of our departments of study,—the classical no less than the English,—the ladies have maintained the highest rank in scholarship. Perhaps it should be added that in our system of marking, 100 represents an ideally perfect standard, and is given only for *special* excellence.

3. Do those girls who are best in scholarship fall below other girls in health?"

It is impossible to answer this question satisfactorily. Among our best female students, are some of the healthiest, and some of the feeblest,—and it is equally true that among our poorest scholars, we find both extremes as to physical health. The true relations of cause and effect are not easily determined. Doubtless it is often the case that those girls (and also those boys,) who make the most marked intellectual progress, sacrifice to some extent, their physical vigor. It seems equally apparent that among our girls, there is more frequently poor scholarship because of poor health, than poor health because of excessive mental work.

4. "Are girls absent on account of sickness, more than boys?"

Yes, though not for sicknesses to which boys are equally liable.

5. "Does the general health of girls decline as they continue in school?"

Not more than as a rule, the health of our American girls declines at home, subjected to its ordinary labors and the demands of society. Our experience in this institution is brief,—covering only a decade of years, but it has given us the conviction that, the regularity of habits, healthful diet, early and abundant sleep, pleasant associations and ennobling ambitions, which here may be enjoyed, more than counterbalance all the injurious influences resulting simply from the sedentary life and mental strain, to which they may be subjected; and that our girls leave us in better physical condition than they would have secured during the same time, under the labors and influences of the majority of homes represented.

In several cases it has been true that the beginning of the fall term has found our girls in a much poorer physical condition, than was theirs at the close of the academic year in June. The severe labors incident to home life, had prevented the rest and the recreation, which the long summer vacation ought to secure, and for physical reasons, if for no others, they have needed to return to their studies.

6. "Do girls get as much physical exercise of the proper kind, as they need while attending school?"

No; nor do they when out of school. If our girls could be dressed with as much reference to health and comfort, as are the boys,—and if instead of doing their own sewing and laundry work, they could spend in open air recreation, the time usually consumed by indoor labor, we believe as large a proportion of them, as of the other sex could take without injury, courses of study fully equal to those now pursued by the boys.

7. "Does the fact of girls studying out of school, in taking music or other lessons out of school hours affect their health?"

Undoubtedly it does. A well arranged course of study ought to comprise all the mental drill that is healthful for the average girl; and as a rule, all study outside, must be excess.

8. "Would the separate education of the sexes affect their progress."

In our judgment separate education is not so favorable to the intellectual progress, or the symmetrical mental development of either sex. Co-education affords to each a mental stimulus of real value; but we by no means affirm that both sexes should pursue precisely the same course of study.

9. "In what way, in your opinion are manners and morals affected by co-education?"

Under wise regulations and proper oversight, both are improved. Co-education in the higher institutions certainly necessitates on the part of instructors, special care and discretion; but where these are wisely exercised, there will be a manifest culture both in manners and morals. The peculiar difficulties are not insuperable, and they are much more than balanced by the peculiar advantages.

It may be added that in these opinions, substantially as expressed, our Faculty are quite agreed.

Very truly yours,
JAS. W. STRONG,
President Carleton College.

FROM PROF. CHARLES A. MOREY, PRINCIPAL STATE NORMAL SCHOOL,
AT WINONA.

Dr. C. N. Hewitt, *

DEAR SIR:—Your questions are received. I have given the subject considerable thought, and have had the opportunity of comparing results. I answer your questions according to my conclusions:

1. Four fifths of our candidates are girls. As a rule they are in good health. We discourage all others from entering the school, as the first element of a successful teacher is strong vitality, and personal magnetism, which can come only of perfect health. This fact destroys the force of the comparison.

2. The average scholarship of the girls is higher than that of the young men by at least 10 per cent.

3. As a rule the best scholars are not the most *robust*; but in my experience they have been strong, FINELY ORGANIZED, *healthy* girls, whose hereditary and other advantages have been good.

4. Girls are absent on account of sickness more than boys; but by their superior acumen, and application they soon make up the loss.

5. Our girls are in better health when they leave than when they enter.

6. We give *all pupils* the same drill in physical exercises. Girls are not so apt to receive its full benefits as the boys.

7. Such outside work, would, as a rule, be detrimental. Free schools give pupils too little work.

8. I think not. Granting that less work should be done by girls at the time of their menses, and that their work should be therefore periodic, I do not think it follows that it is best to separate them from the boys.

9. Morals and manners are decidedly improved by association, provided the guiding influences are good.

I am glad you are taking hold of this subject. It needs more *sunlight*, and less illumination from single *candles*. It takes more than one swallow to make a summer, and more than one person's observations to establish a theory.

Yours truly,
CHAS. A. MOREY.

FROM D. C. JOHN, PRINCIPAL STATE NORMAL SCHOOL AT MANKATO

C. N. Hewitt, M. D., Secretary State Board of Health.

DEAR SIR:—I have the honor of replying to your inquiries as follows:

I. I have observed no difference in the health of the sexes on entering school.

II. No difference in their average scholarship.

III. No.

IV. Yes; girls are more frequently absent for short periods, but upon the whole they do not lose any more time. They are more liable to colds, headache, neuralgia, &c., than boys, but I think the liability arises more from inferiority in clothing than difference in sex.

V. No. A few are obliged to leave school on account of declining health, but they were confirmed invalids at the time of entrance. On the other hand many have steadily improved in health while in school. Study is not incompatible with good health, and a pale face is not necessarily a sign of culture.

VI. Ours do; most of them board themselves, others walk a long distance to secure good boarding places. Very few of our girls get too little exercise, and many get entirely too much.

VII. We exact all the labor from our pupils they can perform. If any one takes outside lessons she must either overtax herself or neglect some of her regular studies.

VIII. I think the separate education of the sexes tends to retard their progress, because it lacks the stimulus of emulation. Boys do not like to be beaten by girls, and girls take great pride in showing their mental equality with the historic (?) lords of creation.

IX. Just as it affects their manners and morals in the family. It is just as reasonable to turn Hindu and separate our sons and daughters in the family, as it is to separate them in the school room, and it produces precisely the same effect upon their character. Separation tends neither to social culture, grace, nor purity; on the contrary it renders pupils careless in dress and manners and often disorderly in conduct. Neither side is so sensitive to the good opinion of its own sex as to that of the opposite; and hence this reciprocal restraint is entirely lost. If boys and girls live together in the family, if they are destined to a life companionship after they leave school, it seems to me difficult to find a valid objection to their co-education. Of course undue intimacy should not and need not be tolerated; but where a proper interest in study is awakened, no danger need be apprehended from this source.

I think it would be well if your board would issue a pamphlet on the ventilation of school buildings, giving plans for buildings of all grades, and then ask the legislature to enact a law imposing a severe penalty upon school officers who fail to profit by the information furnished them.

Respectfully,

D. C. JOHN.

FROM PROF. D. L. KIEHLE, STATE NORMAL SCHOOL, AT ST. CLOUD.

Dr. Chas. N. Hewitt,

DEAR SIR—Your favor of the 14th ult. came duly to hand. I reply as follows:

1. The average health of girls is not as good as that of the boys. It is here about as you see throughout the country.

2. The scholarship of girls is as good, *probably better* than that of the boys.

3. The best scholars are not likely to be the poorest in health.

4. Girls are out oftener on account of sickness than boys.

5. Their health does not necessarily decline toward the close of the term. Sickness is often caused by imprudence and exposure rather than by study. Of course students grow tired as the term progresses.

6. Girls do not get as much physical exercise as the boys. They need more, unless they have long walks to and from school, which is generally the case here.

7. There is not much extra work done out of school; as a rule it is not profitable.

8. In this school there is a preponderance of girls. This, together with the thorough discipline of the school, and the staid disposition of our students makes it the best arrangement to be desired.

9. The manners and morals are improved by the plan of co-education in the school. Where the female element is so largely represented the general atmosphere of the school is more like that of home.

I will say also that the arrangement of our hours for study and recitation are very favorable to the health of students. We are in school six days from 8½ a. m. to 12½. Study hours are from 3 to 5 p. m., and 7 to 9 in the evening. This plan has proven to be a success, and has given us these advantages:

1. Our work is well distributed through the day.

2. We have daylight for study—many students have weak eyes.

3. We have warm dinners.

4. A little work every day of the six has been better than to do all in five, and have two holidays.

Allow me to suggest that the students would be greatly profited by some practical hints as to how to eat; how to bathe; how to use their eyes. We shall be glad to learn the result of your study of this important problem of health and education of the sexes.

Yours truly,

D. L. KIEHLE.

FROM PROF. L. M. BURRINGTON, SUPERINTENDENT OF SCHOOLS, ST.
PAUL.

ST. PAUL, MINN, NOV. 14, 1877.

Dr. Chas. N. Hewitt, Secretary State Board of Health.

DEAR SIR:—Your favor of Nov. 12th, with the accompanying list of questions is before me.

It will be impossible for me to give exhaustive answers to all of your questions, if to any, since the causes of irregularity in attendance of pupils are in many cases beyond the range of our most careful scrutiny. I have consulted to some extent my records for the past three years, and from the results of this examination I will endeavor to give approximate answers. In addition to this if you should require more carefully prepared statistics, I shall be happy to furnish them at some future time.

I. I am not aware that there is any marked difference in the health of boys and girls where they enter school.

II. My judgment is that in the earlier years of school life the girls may average higher than the boys. Although in some classes the contra is the fact.

III. I am not aware that those who excel in scholarship are inferior in health. Indeed I am confident it is the reverse of this.

IV. No.

V. No; unless from influences outside the school.

VI. Perhaps not. Our accommodations are very limited for such exercise.

VII. It depends upon the time given to music. They have sufficient to do without music.

VIII. I would not favor separate schools. My impression is both sexes would be injured by the separation.

IX. Morals and manners depend almost entirely on the teacher. The judicious teacher will accomplish more in a mixed school than in one of either sex.

Respectfully yours,

L. M. BURRINGTON, Superintendent.

FROM DR. C. H. BOARDMAN FOR HIMSELF AND AS THE COLLECTIVE OPINION OF THE STAFF OF TEACHERS IN THE ST. PAUL HIGH SCHOOL.

Query. No. 1.

Answer. There is probably no material difference; individuals of of either sex fall below the standard, and possibly this may be true of rather more girls than boys. It is a fact which has some bearing upon certain of the subsequent questions as well as upon this, that a number of the girls are not unacquainted with manual labor at home, and some of these suffer from overwork, as do others from anxiety due to straitened circumstances, and from kindred influences.

No. 2.

Answer.—Better.

No. 3.

Answer.—To some extent, yes; as might be expected from harder study and greater mental exertion.

No. 4.

Answer.—No.

No. 5.

Answer.—Yes, as regards those highest in scholarship.

No. 6.

Answer.—No.

No. 7.

Answer.—Apparently not.

No. 8.

Answer.—Upon this point there exists some difference of opinion among the staff of the school. Assuming that mental progress is referred to in the question, I think it may fairly be said, that in general there would be no great difference whether the sexes were educated apart or together. In individual cases two opposite results might appear. A certain number whose attention is now diverted by the presence of the other sex would make better recitations under a different system, and, on the other hand, there may be those who would retrograde somewhat on the withdrawal of the stimulus of rivalry. The number of each of these, however, is probably small.

No. 9.

Answer.—On the whole, favorably. It will, of course, be understood that some of these replies are in great measure conjectural; actual experiment alone can supply accurate information. They are, in the main the collective opinion of the teachers of the school, but do not, as a whole, represent the views of any one of the staff. It will also be apparent that nothing short of a house to house visitation, and conferences with the parents of the pupils can enable us to pronounce opinions upon some of the points herein discussed that shall have the weight of strong probability, if not of certainty.

C. H. BOARDMAN.

FROM PROF. O. V. TOUSLEY, SUPERINTENDENT MINNEAPOLIS PUBLIC SCHOOLS.

1st question.

Answer.—From my experience in two latitudes, widely differing, I have concluded, that the health of girls compares favorably with that of boys.

2d Question.

Answer.—The scholarship of girls, on the whole, is better than that of boys.

3d question.

Answer.—I am not prepared to answer this question from a close observation of facts. My *impression* is, that the health of the former, will show an unfavorable contrast with that of the latter.

4th question.

Answer.—I do not think that they are.

5th question.

Answer.—I am confident that a decline in health is quite marked.

6th question.

Answer.—They do not.

7th question.

Answer.—It does most decidedly. The change of dress from 12 to 15 years, and the demands of what are called "accomplishments" will largely explain this decline in health.

8th question

Answer.—I do not believe that such separation would insure greater progress.

9th question.

Answer.—The 9th question involves many considerations, which you may not care to hear. But speaking as the representative of common school education, where nine-tenths of the pupils, with whom I have had to do, are under fifteen years of age, I believe that good manners and sound morals are best promoted through co-education. Dr. Mary P. Jacobi, in the New England Journal of Education of Dec. 13th, 1877, speaking on this subject, says, "During the neutral period of children, girls and boys should be educated together, because the sex does not, properly speaking, exist. During the period of adolescence or of the formation of sex, it is well to establish a separate education, as the character of such is being defined and consolidated. This separation is needed by the moral and physical training rather than by the intellectual.

"It is desirable to prolong as late as possible, the first unconsciousness of sex. At this age, the stimulus desired from co-education, acting upon imperfect organizations, is liable to be other than intellectual—liable to excite emotions equally ridiculous and painful from their prematurity, and therefore to increase the very danger most to be averted from this period of life—the excessive development of the emotional functions and organs of the nervous system."

If the above statements have their foundation in physical causes, they carry grave import, and so far as *advanced instruction* is concerned, I should in the interest of morals, oppose co-education.

Dr. Leonard:—This, I believe, gives you what you desire. If satisfactory to you, all is well.

Respectfully,

O. V. TOUSLEY.

Dec. 24th, 1877.

FROM PROF. O. WHITMAN, SUPERINTENDENT RED WING PUBLIC SCHOOLS.

RED WING PUBLIC SCHOOLS,
SUPERINTENDENT'S OFFICE,
Dec. 1, 1877. }

C. N. Hewitt, M. D., Sec. State Board of Health.

The average health of girls is less than that of boys on entering school, the difference being small in the primary grades and largest in the grammar and high schools. This increase from the lower to the higher grades is not owing to the amount of school work, but rather to facts stated in answers to subsequent questions.

I have spent some time in collecting statistics with the following result:

Average scholarship for the school year ending, June 1877.

High School.

26 Boys.....	78 per cent.
39 Girls.....	80 " "

Grammar Schools.

36 Boys.....	78 per cent.
56 Girls.....	79 " "

Intermediate Schools.

59 Boys.....	74 per cent.
63 Girls.....	77 " "

Primary Schools.

71 Boys.....	77 per cent.
52 Girls.....	78 " "

Thus it will be seen that the average scholarship of girls is uniformly better than that of boys. This is not attributable to superior abilities of the girls, but to the fact that girls attend school more regularly than boys, and are more easily interested in their studies. Boys are allowed greater freedom at home than girls; they are permitted to go out on the street to join their mates in various kinds of sport, while girls are kept in doors, and either amuse themselves with books and papers, or are busy at some kind of work. For such reasons girls like school and school work better than boys, and will outrank them in scholarship.

3. I answer the third question *no*, emphatically. Such girls may be naturally brilliant, but their ill-health affects the scholarship.

4. Yes. Girls are not so warmly clad as boys, and hence are more subject to colds and their attendant diseases. There is great need of reform in the matter of dress for girls.

5. It does not as a rule. Our teachers all agree on this.

6. Girls in the primary grades do, but those in the higher grades do not. Little girls will play as hard at recesses as the boys, but the larger ones take little if any vigorous exercise.

7. Too much study is not only a weariness to the flesh but it is positively injurious to the health. Below the grammar grades, pupils should not be permitted to study out of school hours, and even above these grades, if teachers pursue the right course, there will not be much, if any, need of outside study of school lessons. It is not the hard but the long continued study that is injurious. It is not the length but the kind of application that masters the lesson. While attending school pupils ought not to give any attention to extra lessons. The school work is as much as they ought to do; otherwise they are overtaxed, and in time the health will give out. It is a fact worthy of note that most of such work is imposed upon girls, even those who are already in feeble health.

8. It would. The progress of both boys and girls would be less rapid. Both sexes would take much greater pride in their standing as scholars, if educated together, and emulation is oftener noticeable as existing between boys and girls, than between boys and boys, or between girls and girls. This is true in all grades.

9. By co-education, pupils become more refined, easier in their bearing in society, and more becoming in their deportment. I think it was Gough who said that a young man would never grow round shouldered, if he should meet ladies in his every day walks. There is no doubt but that the moral status of pupils is greatly elevated by co-education, provided that the proper care be exercised over them. It is natural; what God has joined in the family, let not man put asunder in the school.

O. WHITMAN,
Superintendent.

FROM HON. D. BURT, SUPERINTENDENT OF PUBLIC INSTRUCTION.

ST. PAUL, Nov. 10, 1877.

C. N. Hewitt, M. D. Secretary State Board of Health.

SIR:—It is difficult to give unqualified answers to your "questions relating to the co-education of the sexes." There are wide differences between urban and rural home life, and children under the customs of the city, especially in some families of the wealthier classes, may be physically degenerated by influences not connected with the schools or study. In the country, hot biscuit, pork and grease, and feather beds that contain too much of the *fowl*, may be the real cause of ill health that seems to originate in the school room. The domestic customs of our foreign born population differ widely from those of many American families, and result in different grades of health and types of disease. Then there is disease inherited, and disease induced by wrong personal habits. We should not attribute to proximate methods of education, what ought to be referred to such remoter agencies.

I have taught or superintended schools, city and rural, in seven different states, east, south and west, and a wide observation convinces me that most answers to inquiries like yours are the result of narrow induction, and not the average truth.

Confining myself to our public schools, and attempting to average city and country, home born and foreign born, rich and poor, I venture the following replies.

1. As regards the comparative health of girls and boys when they first come under the influence of the schools, I have noticed no great difference. At that age the health of both sexes depends upon laws that are common to both. The physical strength of girls may be less than that of boys without implying inferior health.

2. I have noticed no greater differences between the scholarship of girls and boys under twelve years of age, than between different children of the same sex; if by scholarship you mean attainment in letters. If the term includes ability to learn, girls often succeed in some studies better than boys, and vice versa.

3. Good scholarship in both girls and boys is apt to appear in connection with a nervous development somewhat at the expense of muscular development; but there are no greater differences in this respect between bright girls and dull girls, than between bright and dull boys.

4. I have not noticed that girls before the age of sex peculiarities are absent from school more than boys, on account of illness. Some girls are often more courageous in facing cold weather than some boys, and generally their powers of endurance do not fall below those of boys.

5. The health of both girls and boys is apt to suffer from long terms and continual attendance in city schools under high pressure. I have rarely seen this in rural schools. I do not think that girls give out under severe application to study sooner than boys; that is, under the age of puberty.

6. In country life there is not often a lack of exercise in either sex; but in city life and schools, girls are not apt to take as much exercise as boys, sometimes not enough for good health, especially after they become misses.

7. Girls that undertake "music and other lessons," and at the same time attempt to do full class work in school, suffer in health for the folly of undertaking double work. It would be so with the other sex.

8. If girls and boys cannot study as effectively in the same schools as in separate schools, the fault is in the management of the school and not in sex peculiarities. I believe that a school not so managed as to be free from hindrances to progress on the plan of co-education, needs a better teacher rather than a separation of its boys and girls.

9. In schools under teachers of good morals, and the refinement necessary to teaching, I think co-education favorable to the morals and manners of both sexes. If teachers are low in morals and weak in management, and the school premises are not properly arranged, and the district not fully civilized, a great deal of corruption may exist in schools composed of both sexes. The same would probably be true in schools under such conditions, composed wholly of either sex.

The imperfections that some are fond of seeing in certain of our public schools, result, so far as they exist, more from bad morals in parents and general society than from defects in our plan for popular education.

Were I to extend your inquiries to schools other than those of our common and graded system, and to girls in incipient and maturing womanhood, my answers would need more qualification. I have noticed that young ladies after that period are more apt to give out under long confinement in school than are young men. They take less exercise, and pernicious customs often work toward that result. The physical and the mental constitution of maturing and mature womanhood requires lines of study suited to feminine peculiarities, and different, somewhat, from those required by the other sex. I do not, however, believe in a style of "Ladies' Seminaries that make the accomplishments a specialty." Planes and sand paper must be used before varnish can be successfully applied; yet in the other extreme, there may be an excessive use of the jack plane. The regimen at Mount Holyoke as it was some years ago, was too rigorous for many young ladies. The wants of young women seem to be well met in seminaries and colleges for them exclusively; yet I see not why the two sexes, if there be courses of study proper for each, cannot meet with advantage to each, in the recitation rooms and in the well regulated social intercourse of the same institution.

Respectfully yours,

D. BURT.

FROM PROFESSOR J. L. NOYES, SUPERINTENDENT OF THE MINNESOTA INSTITUTE FOR THE EDUCATION OF THE DEAF, AND DUMB, AND THE BLIND.

FAIRBAULT, MINN. Dec. 1st. 1877.

C. N. Hewitt, M. D.

DEAR SIR:—In answer to your questions I desire to say,

1. On entering school we perceive no difference in the health of our male and female pupils.

2. In scholarship the girls are fully the equal of the boys. Our record shows from one to two tenths in favor of the girls.

3. No. The best scholars among the girls enjoy the best health.

4. They are not, i. e. the girls are not absent more than the boys on account of ill health,—our daily and weekly reports show this.

5. No; on the contrary, the general health improves as they advance in their course.

6. The girls do not exercise as much as the boys in the open air, but have a good share of indoor exercise.

7. Study out of school hours is limited to both boys and girls.

8. It would affect it unfavorably, if at all.

9. Co-education under proper government, affects both "*manners and morals*" favorably. It makes both sexes more modest, polite and mindful of little things, and tends to relieve the mind of youth

of that morbid, sickly sentimental idea, in regard to the sexes, that often prevails in children and youth who are educated without this mutual reflex influence. All of my teachers here agree with me in this opinion.

In regard to what has been expressed above concerning the health of our girls, I am happy to say, that Dr. Nichols, our physician for 15 years, fully accords in opinion with all that I have expressed.

Very truly yours,
J. L. NOYES.

TABLE SHOWING SOME OF THE VITAL STATISTICS
OF SCHOLARS IN SCHOOLS NAMED.

COMPILED BY THE SECRETARY.

NOTE.—This table is worked up from returns made by the following named gentlemen:

University—The Secretary of this Board.

Carleton College—Prof. Sperry, of the college.

Mankato Normal—Prof. Morey, Principal.

St. Cloud “ —Dr. A. McDonald, St. Cloud.

St. Paul High School—Dr. C. H. Boardman, St. Paul.

“ “ “ “ —Examination of sight and hearing by

Dr. Francis Atwood. St. Paul.

Winona High School—Principal.

Red Wing High School—Drs. Sweeney and Hewitt.

Deaf and Dumb Institution—Dr. W. H. Leonard, of Minneapolis.

The additional reports are appended to the table.

NAME OF INSTITUTION.	AGE, in years.		HEIGHT, in feet.		WEIGHT, in pounds.		SPIROMETER, [†] Breathing capacity in cubic inches.		CHEST MEASURE, With tape in inches.				NO. YEARS AT SCHOOL.		STUDENTS' NATIVITY.		STUDENTS' NATIVITY.		STUDENTS' NATIVITY.		STUDENTS' NATIVITY.		PERCENTAGE OF defective sight, chiefly Myopia.		HOURS of study out of school.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
State University—*	23.32	20.60	5.75	5.38	150.42	120.34	390.76	253.75	36.87	32.54	33.47	20.41	3.35	2.90	55	24	3	.....	46	22	13	2	15.0	29	16	.....
Average of College classes.....	19.26	.....	5.80	.....	138.76	.....	336.30	.....	35.52	.....	32.35	.....	0.42	.....	26	.....	1	.....	20	.....	7	.....	4.0	.....	.....	.....
" 3d and 4th class.	20.79	.....	5.78	.....	144.55	.....	363.53	.....	36.19	.....	32.91	.....	1.89	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total average.....	19.84	18.13	5.60	5.26	148	133	330	183	36.80	34.32	33.85	31.88	.....	.....	28	58	13	37	.....	.....	.....	.....	.....	.....	.....	.....
Carleton College.....	19.20	17.61	5.61	5.31	141.25	127.76	.....	.....	35.81	33.30	.....	.....	.....	.....	21	69	4	.....	14	58	14	11	.....	.....	.....	.....
Winona Normal.....	18.69	16.68	5.63	5.24	142.51	119.33	.....	.....	34.35	33.34	32.52	31.82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.02	11.02	2.6	2.45
St. Cloud Normal.....	15.94	16.22	5.42	5.25	.....	.....	.....	.....	34.41	32.61	31.68	31.14	.....	.....	32	54	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
St. Paul High School.....	17	16.50	5.56	5.30	133.50	114	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Winona High School.....	15.85	16.02	5.37	5.17	117.51	113.79	277.65	215.12	.....	.....	.....	.....	.....	.....	9.18	9.05	30	39	4	20	28	14	15	.....	.....	.....
Red Wing High School.....	16.20	15.56	5.27	5.05	120.72	109.36	248.05	176.40	83	28.83	.....	.....	3.50	3.20	13	17	4	7	7	7	10	17	28	00	16	.....
Deaf and Dumb Asylum.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Not all the students examined.

†No ladies in those classes examined.

‡The Spirometer used is so imperfect as to make the records only of use for comparison.

A letter from A. Macdonald, M.D. of St. Cloud, accompanying the Vital statistics of the State Normal School at St. Cloud.

ST. CLOUD, MINN, Dec. 22nd. 1877.

C. N. Hewitt, M. D., Secretary State Board of Health,

DEAR SIR:—On Wednesday morning agreeable to your request I visited the Normal School for the purpose of making a statistical report of the students. Profesor Keihle received me with his well known urbanity, and offered every facility for the accomplishment of my task. Unfortunately for the thoroughness of the statistics which I submit, the school was in the midst of its busiest season, having just commenced the customary examination at the end of the term, preventing for the want of time, my making a more satisfactory report. There are one hundred and twelve in attendance in the Normal department, and fifty eight in the Model schools.

I found the students as a class physically well developed, bright and intelligent, yielding scrupulous obedience to the admirable discipline of the school.

The school a large and handsome building evidently constructed with due attention to comfort and sanitary rules, is situated on a high bank of the Mississippi River. The class rooms are large and airy with high ceilings and forming each a complete system of ventilation, which can be regulated at will. The entire building is heated by pipes supplied with steam by an engine in the basement.

The grounds, which have been much improved during the past summer under the supervision of Profesor Keihle, are large and ample for the purposes of a first class school. The Normal home, situated in the school grounds, a large and well built structure, is under the charge of Mrs. J. H. Gates, who with singular tact has succeeded in making it a very desirable home for young lady students. It is conducted on the family co-operative plan, with such success that first class board is furnished for the small sum of two dollars and twenty five cents per week.

The teaching staff of the school consists of eight, including Prof. Kiehle, Principal, and Miss Ella M. Stewart, Superintendent of model schools.

The average attendance at school is very high being 98 per cent. The pupils have been exceedingly healthy, there being but little absence from illness.

They have been free from headaches and other symptoms attendant on close and ill-ventilated rooms.

There are six working days in each week, the hours of attendance at school being from 8½ a. m. to 12½ p. m., dissimilar to the hours of attendance in most schools, but for many reasons very desirable.

In the first place the week's work instead of being crammed into five days, is spread over six, lessening the work of each day, and giving plenty of time for exercise and recreation.

In the second, the students have many hours after school for study by day light, a no small saving of eye sight, and relieving them of the necessity of contracting the pernicious habit of sitting up late at night preparing their lessons. I find little or no complaints as to ill health among the students, and their eye sight has in but very rare instances been affected by attendance in school and consequent study.

Yours, very truly,
A. MACDONALD.

A Communication accompanying the vital statistics of the St. Paul High School, by Chas. H. Boardman, M. D., of St. Paul.

Of the pupils of the High School examined by me, 180 in a total of 200, the majority presented an appearance of excellent health; the proportion of those who were manifestly delicate was very small. Still it is no doubt true, that a more critical investigation would reveal a lower standard than could be ascertained by a mere inspection or a few cursory questions; and it is probably equally true, that this would hold good of more girls than boys.

The fact that it is known that here and there a girl is suffering from causes which need not here be detailed, and whose health is more or less impaired by influences which are peculiarly obnoxious at the period of sexual development, warrant the assumption that there are others possibly not a few, who, although warned by nature that a physiological process may become pathological, have not yet made complaint.

Among the statistics herewith transmitted, two features relating to this subject are significant and require no comment, the length of time devoted by the girls to study, and the frequency of headaches among them, 50 per cent. being affected in this way.

In connection with this topic reference might be made to the total absence of facilities for exercise, to the frequent ascent of stairs, and to the miserably imperfect ventilation of the main room of the High School. Of course I do not refer in the foregoing remarks to the derangement of any single function, but multiform evils which spring from lack of proper regard to the demands of nature, at a critical period, and which need not be enumerated. Those who care to enter upon a fuller consideration of the subject are referred to Dr. Mitchell's "Wear and Tear," and Dr. Clarke's "Sex in Education."

The causes of, as well as the remedies for the physical disabilities noted at the St. Paul High School, demand more careful consideration than it is possible for the writer at present to bestow. Reference will therefore be made only to some of the more obvious defects which were observed, and for which the proper correctives will be suggested by their mere mention.

It may be here premised that no special infirmity was discovered except headaches, so far as could be ascertained by a hasty and necessarily imperfect examination of the pupils themselves. These, however, existed, as stated above, in the proportion of 50 per cent.

among the girls, and of nearly 25 per cent. among the boys. Without information as to specific causes, which doubtless obtain in some degree, or of individual cases, the difficulty may fairly be attributed in great measure, at least, to certain influences whose operation must be as prejudicial to health as their existence is apparent.

First among these causes may be placed deficient ventilation. The main or assembly room of the school, a large apartment, the dimensions of which I cannot now state, but in which at stated periods is collected the entire school, numbering over two hundred, has as its only direct cold air supply a duct of 7 inches in diameter; this being supplemented by the occasional opening of windows at recess. In the ceiling are several circular openings, in accordance with the system once regarded as orthodox. The same absence of ventilation is observable in the smaller recitation rooms, in which supplies of fresh air can be obtained only in the brief intervals which occur in the changing of classes. No comment is required to emphasize the inadequacy and imperfection of this arrangement.

Closely associated with this evil is the total absence of facilities for exercise. Without proper adaptation to the purpose for which it is used, the High School building stands at the intersection of two of the busiest streets in the city, leaving neither play grounds nor gymnasiums, and affording no opportunity for relaxation other than strolling about the class rooms, or up and down stairs in the hall. It is true that some compensation is found in many instances, in the long walks which must be taken in going to and returning from school, but this privilege is not enjoyed by all, nor does it supply the place of the appliances which should be found in a well ordered school.

Again, the conclusion can scarcely be avoided, that many of the pupils, notably among the girls, devote an amount of time to their studies, in addition to the regular school hours, that is largely accountable for the departure from a healthy standard. That eight, nine, and in a few instances, ten hours per diem of more or less active brain work must make trouble, especially for those in whom the process of development is yet in progress, is axiomatic, and therefore requires no demonstration. As a rule, those who studied longest were most prone to suffer.

Reference may be made in this connection to conditions concerning which no questions could be asked of the pupils, but which existed in certain cases as ascertained from other sources; although it is improbable that the whole number of these is known.

Opportunity is at present wanting to secure information for the basis of an opinion as to the effect, if any, upon the health of the pupils of the arrangement of the school rooms, of the style of seats and desks, of the system of rating scholarship, and for the determination of other questions of interest and importance.

Further and more systematic inquiry with reference to these subjects is desirable and should be instituted.

C. H. BOARDMAN.

From Dr. Francis Atwood, report of examination of Sight and Hearing in pupils of St. Paul High School.

ST. PAUL, MINN., Dec. 14, 1877.

Dr. Hewitt.

DEAR SIR:—I have finished making the examination in 191 pupils in high school. In testing sight I used "Suellen's Type" at 20 feet, of 105 girls 13 were myopic, of 86 boys 8 were myopic. As regards the hearing I found but very little trouble, there only being three or four whose hearing was materially affected.

Yours very respectfully,

FRANCIS ATWOOD.

From Dr. W. H. Leonard, Minneapolis, respecting vital statistics of Institution for Educating Deaf, Dumb and Blind, taken by him.

MINNEAPOLIS, Dec. 26, 1877.

DEAR DOCTOR:—I went down to Faribault, Monday. The enclosed is the result of my work. It is not altogether satisfactory though as well as could be done now. The scholars did not fully understand what was wanted of them. In inhaling we could not make them fill their lungs. Also in examining the eyes, the younger ones especially, the last on the list, we were not always certain whether they saw the letters or not.

I made only a few remarks. I look upon the greater part of them as strumous, even those who have had cerebro-spinal meningitis are of this class. It would have been well to have noticed this part of the examination more. I was hurried and had no time to visit the blind asylum. There are only two pupils left during holidays.

A way to fill up this institution and gain the confidence of the people and sensible mothers is to send Prof. Noyes or some reliable representative of the Institute out to visit subjects who should be inmates of the school.

Prof. Noyes was pleased with the plan of physical exercises in the colleges and schools, and hoped the board would recommend it for the Asylum, if so would purchase a spirometer.

Yours truly,

W. H. LEONARD.

[NOTE, as to Barnes, Dry Spirometer, in the physical examinations at the State University and at Carleton College.

This instrument proves to be entirely unreliable for any other than comparative measurement. Suspecting it the Secretary wrote to Profeser Sperry and the subjoined notes of Professor Sperry and his assistant at Carleton explain the cause of error. It does not however affect materially the object for which these preliminary experiments were made, so that the conclusions are sufficiently accurate. The letters are subjoined in justice to the gentlemen who kindly investigated the accuracy of the instruments, and who promise to aid in the further collections of vital and health statistics.]

LETTER FROM PROFESSOR L. B. SPERRY, OF CARLETON COLLEGE, RESPECTING SPIROMETERS.

NORTHFIELD, MINN. Dec. 29th. 1877.

Dr. C. N. Hewitt, Red Wing, Minn.

DEAR SIR:—Circumstances prevented me from giving personal attention to the Spirometer yesterday, but my assistant, Mr. B. F. Thomas, made a careful examination of it, and reported the results to you by yesterday's mail. From our observations it will be seen that these Spirometers are not reliable for determining *actual chest capacity*; but for determining *comparative* chest capacity, they are of some value. In your report you can make such explanatory remarks on this subject as you may think wise. As soon as I get time and strength shall be glad to confer with you concerning some practicable method, of making exact observations in the direction of lung capacity. I am having a wet spirometer made with which to take careful observations during our next term.

Please excuse the use of an amanensis, I am on the sick list temporarily.

Yours respectfully,

L. B. SPERRY.

REPORT OF TESTS APPLIED TO THE "BARNES' DRY SPIROMETERS" BY
PROF. B. F. THOMAS, CARLETON COLLEGE.

NORTHFIELD, MINN., Dec. 28th, 1877.

Dr. Hewitt, Sec. State Board of Health, Red Wing,

DEAR SIR—Being much interested in the vital statistics taken by Dr. Sperry, yourself, and others, and desiring to know to what extent the difference in results reached was due to imperfections and differences in apparatus used, I undertook the comparison of your spirometer with that of Dr. Sperry, and the determination of the *actual* capacity of each. I first compared the tubes upon which the numbers are stamped and found that, when the zeros of the two correspond, 450 on Dr. Sperry's instrument agrees exactly with 480 on yours. Then taking both apart and measuring the receivers, I found them to be exactly equal in external measurements, evidently made from the same pattern, hence the actual capacity of



the two should be equal. This being true, the two will give different readings for the same amount of air, which was found to be the case when they were placed side by side and blown into by the same person, your instrument giving in each trial, from 20 to 30 units greater indication. The scales are inaccurately graduated, your own being the more regular in its divisions.

I then set about testing your instrument for actual capacity by displaced air, using the best method known to me, and working with great care and accuracy, recording the reading shown by the scale after each of twenty-four equal quantities of air was introduced. The actual capacity of the instrument is 355.5 cubic inches, corresponding to 500 of the scale, hence the indicated reading is too great by .31 of itself *at the end of the filling*. The error is greater in the first half of the filling, and is accounted for by the fact that, as the sides of the receiving sack are collapsed, bent *inward* during the early stages of the filling, and the folds do not become distended readily, the introduction of a quantity of air when the instrument is nearly empty, will cause a greater vertical motion (to compensate for the smaller diameter of chamber at this stage) than the introduction of a like quantity when it is nearly full, thus giving greater differences between successive readings in first half than in last half of filling. In the limited time at my command for the purpose, I was able to take but two series of readings, but as the amount of air introduced to cause a reading of 500, was in each series *exactly the same*, I feel justified in concluding from the great discrepancies observed between intermediate readings, that the instrument *is not all trustworthy*, because of the irregular results shown by it, due to irregularities in its folding and unfolding. It seems to me to have been intended for the use of traveling showmen and not for such ends as we seek. Am sorry to have been unable to extend the trials, and thus obtain more extended data, upon which to judge the piece. In view of the last conclusion named, we shall abandon the statistics obtained last year, and take a new series with a new instrument which I am having made, on the plan of the gas holders with moving bell. If you wish I will send you the record of trials of your instrument.

Yours very truly,

B. F. THOMAS.



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